Project Name: Chatbot for online stores

Functional Specification

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1. Introduction

1.1 Overview

The system we are developing is a chatbot for online stores that will allow users to ask questions about products available and the chatbot will return relevant information. We thought this project would be a good idea as online shopping is becoming increasingly popular nowadays especially now with the current pandemic. With the closure of many stores due to restrictions more and more people are having to do shopping on the internet. We choose to do a chatbot because of the growth of chat based interfaces. A lot of websites which you visit nowadays have some sort of chat based interface ,e.g. support chatbot, that users can access to gather more information.

Users will also be able to request reviews of the product which will format the reviews in a clear and understandable way such as a bar chart/pie chart letting the user know how many positive, negative or neutral reviews there are. If the user then wants to make a purchase after seeing all this information, they can request a link to the website which they can make the purchase.

Our target audience is anyone who is looking to purchase a product online and wants to research the product beforehand. We believe our idea will make it easier for users to find the product they are looking for without having to search through multiple web pages.

1.2 Business Context

We believe this can be a handy little tool used a lot by customers because it would impact on businesses by helping customers make decisions about whether they want to buy products or not more quickly as well as helping them understand what other people think of the product. All customers apply here as anyone who has the know-how to purchase products online will not have any problem using our chat bot

1.3 Glossary

Chatbot - A chatbot is a piece of online software that simulates a conversation with the user through text as if they were speaking to a real person.

2. General Description

2.1 Product / System Functions

This chatbot will be found on its own website. It requires so sign up or need for user's personal details of any kind. They can start using the chatbot right away.

A user will ask to see reviews of a certain product on Amazon, e.g "Show me the reviews for the Amazon Alexa 4th Generation". The chabot will find said product on the website and collect all the reviews it has via an API. It will then perform sentiment analysis on those reviews and graph the results on a pie chart/bar chart which will be returned to the user. The graph(s) will be split into positive, negative, and neutral.

A user may also request information about the product such as price, dimensions etc. The chatbot will then search the product page on Amazon and find the requested information, returning it to the user. At any time, the user may request a link to the product page should they wish to buy the product.

2.2 User Characteristics and Objectives

User's will use this bot when they wish to purchase a product from Amazon. We don't expect much technical experience beyond an interest in online shopping, though we hope we can simplify the process for them.

Our goal is to make it easier for them to find out all they need to know about a product they are interested in and buy it. Maybe the user finds it difficult to navigate the website and find the information they need on products as there can often be so much to read. We hope to simplify the process for them by allowing them to ask and then receive whatever information they desire about a product. Therefore, our tool must be efficient, accessible, and above all, simple.

2.3 Operational Scenarios

User is interested in a product on Amazon.com

In this scenario the user will type into the chatbot “Show me the reviews for the Amazon Alexa 4th Generation.” The bot will then go off and locate said item and perform sentiment analysis on its reviews and return to the user a pie chart/bar chart giving a breakdown of how many reviews were positive, negative, or just neutral.

Let’s say the user wants more information about a product than just the reviews. They will type into the bot “Tell me about XXX” and the bot will return some general information about the product they wish to purchase. Or more specifically they can say “How much is XXX?” to receive only the price.

Lastly, the user will decide that what they have seen of a certain product is exactly what they are looking for and wish to buy it. They will type into the bot “Can I buy this product?” for which they will receive a link to the Amazon page in which they can purchase said item.

2.4 Constraints.

We have gathered below a list of possible constraints facing the design team going forward with the chatbot.

Language Understanding

The chatbot needs to be able to understand several ways that each question can be asked so ensuring that as many of these as possible are covered is important. As we have little experience working with Natural Learning this will be a challenge to implement. People also tend to use slang or may leave out certain words in query as they feel the search they have given will still be understood.

Requirement of the users

Can we sufficiently fulfil the needs of our users within the timeframe and deliver a chatbot that will improve customers experience? Will the users be happy with the product? The challenge here is to ensure that we develop a product that the user wants and will meet their needs.

3. Functional Requirements

3.1 Gather Product Information

Description

We must be able to properly retrieve all the required information on each product that is requested by a user. This includes price, description, reviews, whether the item is in stock or not etc. This process will happen in response to a user query and it must happen efficiently. An API will be used to gather such information though that failing we could also implement web scraping.

Criticality

Without this we don't have a project. Everything we are doing is built around being able to get this information as we need it so this may be the most crucial element of the entire project.

Technical Issues

Some products may have tens of thousands of reviews so we need to ensure that our system can handle such a number and still run efficiently to be satisfiable to the user. People are not going to wait around long for this information so we need to deliver it to them quickly.

Dependencies with other requirements

The rest of our system is completely dependent on this requirement working correctly. Without it, the sentiment analysis won't be possible as well as other user queries about products and their ability to receive a link to purchase any item they desire.

3.2 Sentiment Analysis on Product Reviews

Description

Here we require our bot to take in all the reviews for a requested product from the user and perform sentiment analysis to get a number for how many of them are positive, negative, or just neutral. The reviews will come directly from the website via an API or web scraping method. From this the bot will make a bar chart/pie chart showing the user these results in a clear and understandable way.

Criticality

This is a crucial part of our system as one of the main reasons we chose this project was so that we could experiment with sentiment analysis and what could be done with it. One of our goals with this project is to offer a different system to the star system offered by Amazon and text reviews to just let people know how many people are saying positive things versus negative things.

Technical Issues

There are a number of technical issues facing us in this project. For one we have never come across sentiment analysis or machine learning in our college work to date so there will be lots for us to learn in order to create a fully functioning project by the end of the year. Getting these components to work together will also be quite the challenge but once we feel we are more than capable of handling.

Dependencies with other requirements

The bot's ability to perform sentiment analysis will be directly linked to how well we are able to collate the reviews for the user's requested product(s). If we do not do this properly then the bot will not be able to perform one of its key tasks.

3.3 Request Product Information

Description

In this scenario the user will ask the bot to give them some information about a product they are interested in. This can be things such as price, dimensions etc. The bot will then locate said information on the product page via an API or web scraping method and then return the information to the user.

Criticality

This is an important part of the system because users will always require some of this information before they proceed in buying a product. They might not rely on reviews so much and want to read the product description themselve, for which we need to be able to provide it to them.

Technical Issues

This is certainly a feasible requirement to accomplish. Attention must be given to how we are splitting price, description, dimensions etc when gathering the

information. A user who has requested to see the price is not going to want to receive the dimensions as a response from the bot.

Dependencies with other requirements

There is a dependency between this and our first requirement, the gathering of the product information. As stated in the technical issues, the gathering of the information must be done correctly so as to avoid a scenario where the user is receiving information that they did not ask for.

3.4 User Request Help

Description

This last scenario is in the event that the user does not know how to proceed with something. They can type “Help” into the chatbot to receive a detailed explanation of how exactly to use the system. This will cover all the basic commands such as requesting specific product information or reviews and more general commands such as a simple “Tell me about XXX” which would return many pieces of information on a product.

Criticality

We believe this to be very important as users must know how to use the system and all its features. It would be a disservice not to provide them with some sort of explanation should they need it.

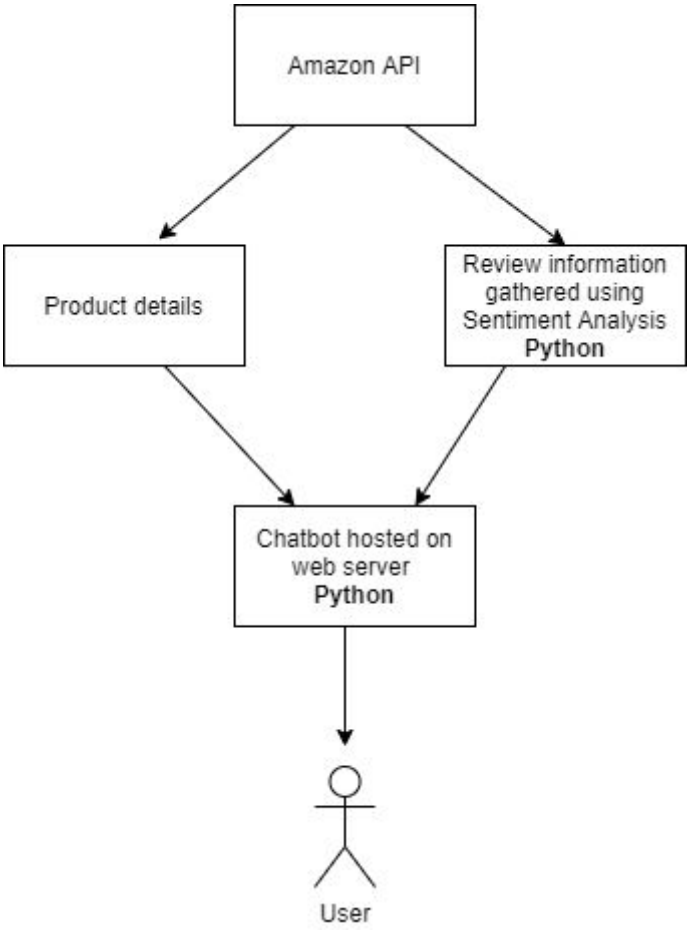
Technical Issues

We don’t see many, if any, problems arising from this portion of the project.

Dependencies with other requirements

This scenario is not directly related to any other but the knowledge the user will gain from it will certainly help in using the other features of the system so the user will depend on this themselves.

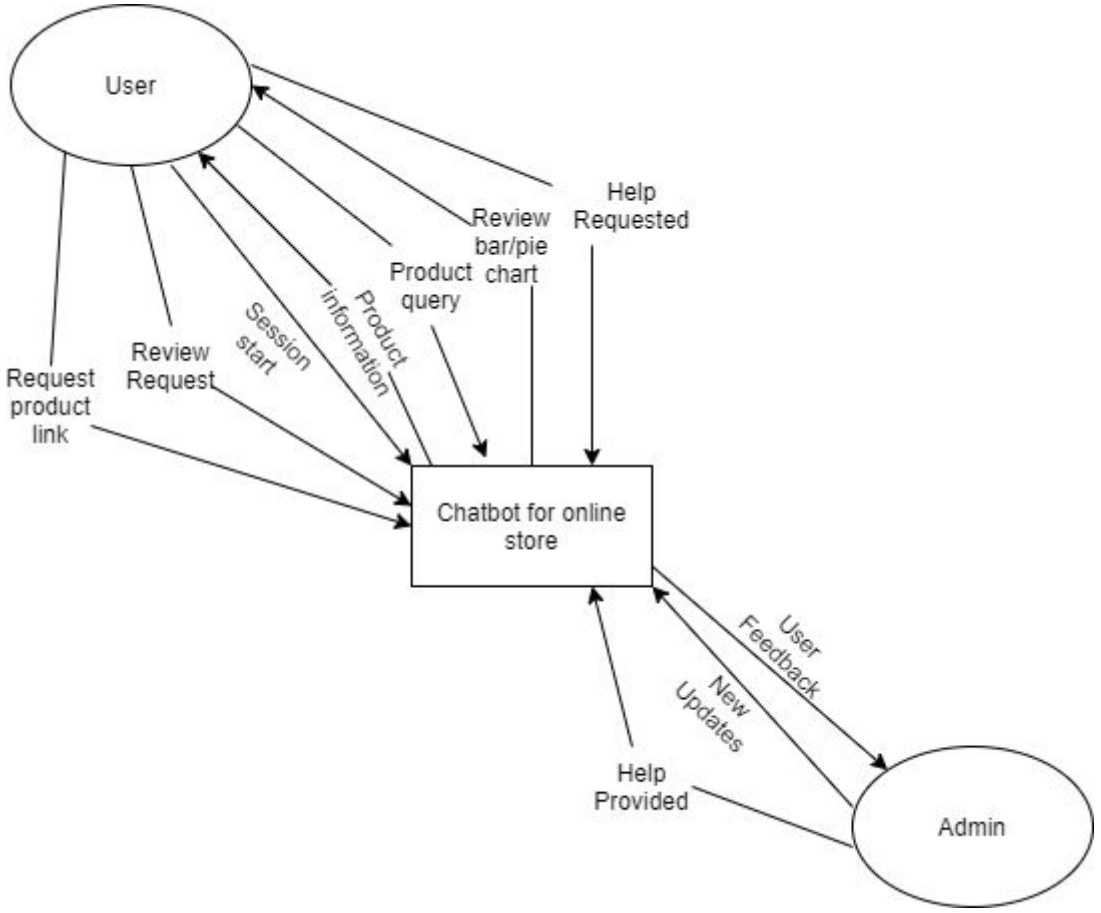
4. System Architecture



5. High-Level Design

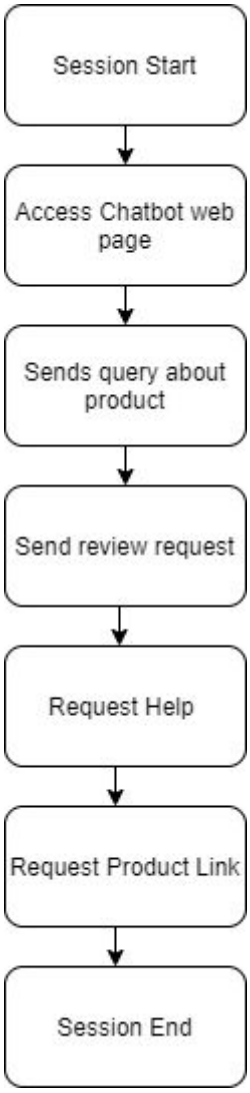
5.1. Context Diagram

The context diagram shows the flow of information between the user and admin with the system.



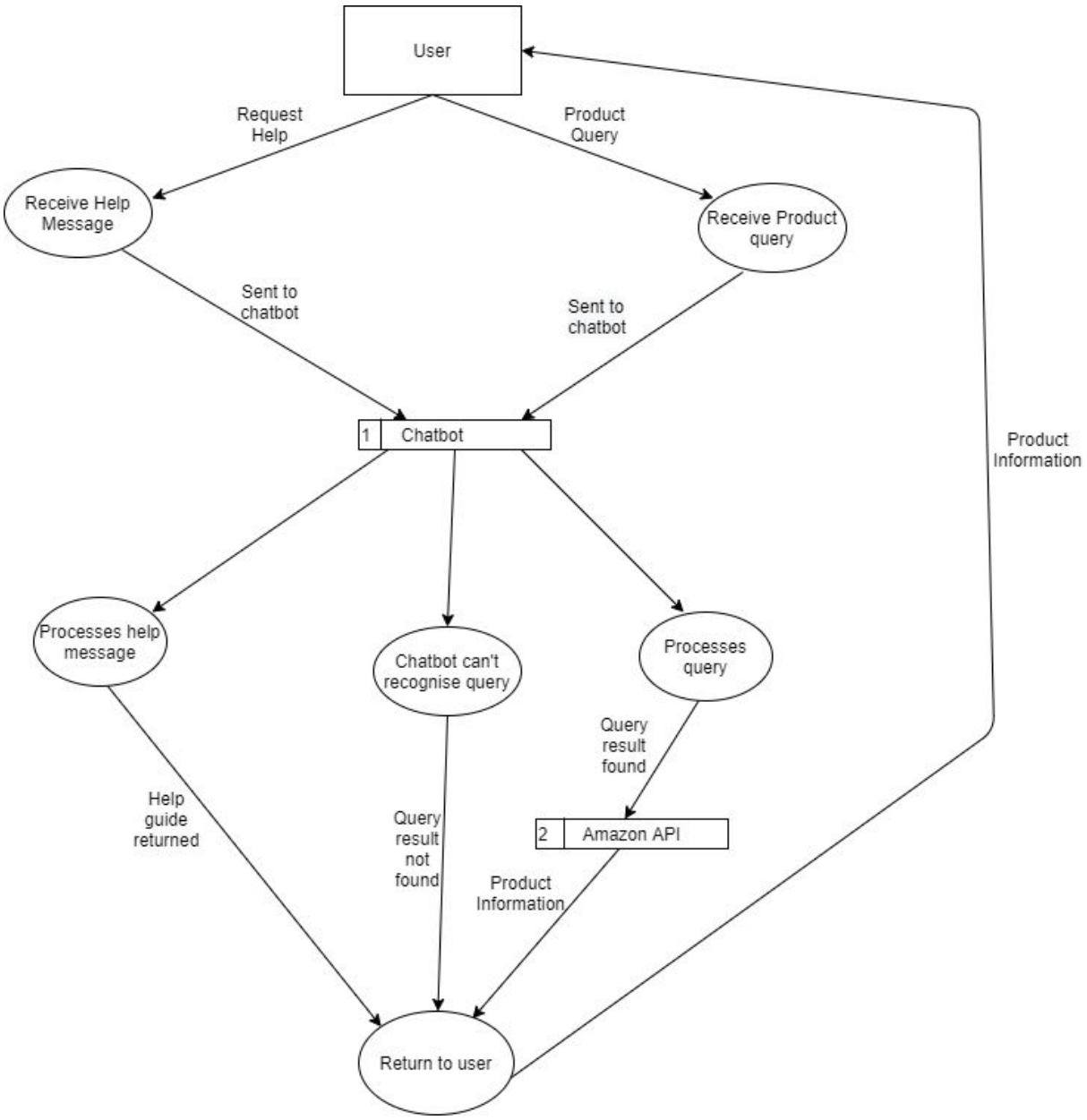
5.2. Design Diagram

Diagram of all the options available in the app to users.



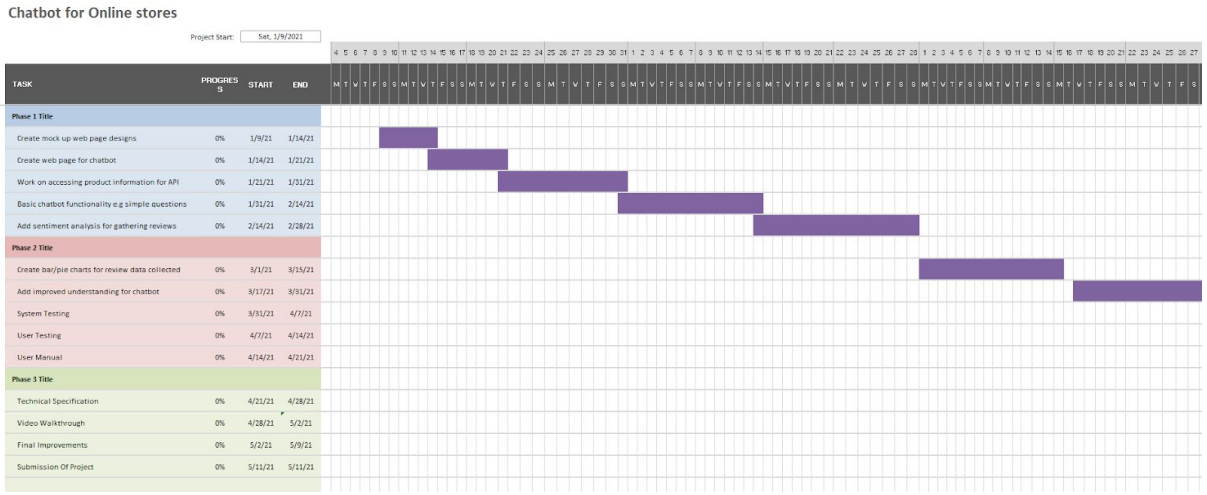
5.3. Data Flow Diagram

This DFD (Data Flow Diagram) shows the flow of data during each process and what data is input and the outputs of each process.



6. Preliminary Schedule

This is a rough schedule of each phase of the project to help give us an idea of what needs to be completed and how much time should be assigned to each task.



7. Appendices

Python Flask

https://flask.palletsprojects.com/en/1.1.x/

Amazon API

https://webservices.amazon.com/paapi5/documentation/